UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,353	05/30/2001	Yan Wang	020130-000111US	8319

20350 7590 02/04/2005

TOWNSEND AND TOWNSEND AND CREW, LLP
TWO EMBARCADERO CENTER
EIGHTH FLOOR
SAN FRANCISCO, CA 94111-3834

EXAMINER	
HUTSON, RICHARD G	
ART UNIT	**PAPER NUMBER**
1652	

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/870,353	WANG ET AL.	
	Examiner	Art Unit	
	Richard G. Hutson	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15,17,18,20 and 22-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15,17,18,20 and 22-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicants amendment of claims 15 and 20 and the cancellation of claims 1-14, 16, 19 and 21 in the paper of 11/22/2004, is acknowledged. Claims and 15, 17, 18, 20, 22-42 are at issue and are present for examination.

Applicants' arguments filed on 11/22/2004, have been fully considered and are deemed to be persuasive to overcome some of the rejections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

Claim Objections

Claims15 and 18 are objected to because of the following informalities:

Claims 15 recites "comprises an amino acid sequence that has at least 50% identity to a 50 amino acid subsequence of SEQ ID NO: 2". It is suggested that applicants amend this recitation to "comprises an amino acid sequence that has at least 50% **sequence** identity to a 50 amino acid subsequence of SEQ ID NO: 2".

It is further suggested that claim 18 be amended in a similar fashion as claim 15 above.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 15, 17, 18, 20, 22-29 and 30-42 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a protein comprising two heterologous domains wherein the first domain is a sequence-non-specific-double-stranded nucleic–acid-binding domain joined to a second domain which is a DNA polymerase domain, wherein said sequence-non-specific-double-stranded nucleic–acid-binding domain is selected from the group consisting of Sso7d or Sac7d, does not reasonably provide enablement for any protein comprising two heterologous domains wherein the first domain is a sequence-non-specific-double-stranded nucleic–acid-binding domain joined to a second domain which is a DNA polymerase domain, wherein said sequence-non-specific-double-stranded nucleic–acid-binding domain comprises an amino acid sequence that has at least 50% identity to a 50 amino acid subsequence of SEQ ID NO: 2 or said sequence-non-specific-double-stranded nucleic–acid-binding domain comprises an amino acid sequence that has at least 75% identity to the Sac7d sequence set forth in SEQ ID NO: 10. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The rejection was stated in the previous office action as it applied to previous claims 15-29 and 30-42. In response to this rejection applicants have amended claims 15 and 20 and traverse the rejection as it applies to the newly amended claims. Applicants traverse the rejection and present the Rule 1.132 declaration by Dr. Peter Vander Horn.

Applicants submit that the previously pending claims 15-29 and 30-42 which were rejected as lacking enablement define the non-specific DNA binding domain by sequence identity to prototype sequences. Applicants submit that the parent application, now issued as U.S. Patent No. 6,627,424 has claims reciting a binding domain having at least 90% homology to Sso7d. Applicants further submit that the pending claims submit 75% and 85% identity to Sso7 and claims 30-42 recite similar percent identities for Sac7d. Applicants attention is directed to claim 15, which continues to be drawn to those proteins comprising a sequence non-specific double-stranded nucleic acid binding domain comprising a mere 50% identity to a 50 amino acid subsequence of SEQ ID NO: 2.

Applicants present a recent Board decision Ex parte Yuejin Sun et al., which applicants submit is powerfully persuasive in favor of allowing the instant pending claims. Applicants reference to this Board decision is fully acknowledged, however, this is not found persuasive, because without knowing all of the particulars of the referred to decision and subject application, it is not possible to fairly judge the allowed claims. Applicants are reminded that each application is different and must be judged on its own merits in light of its specification and its art.

Applicants continue to argue that according to Dr. Vander Horn, a Genbank search readily identifies at least 18 known DNA binding proteins that have amino acid identities of between 98-79% and that this indicated this group of proteins represents an old family tree and that Dr. Vander Horn has created a hybrid protein combining known natural variations to obtain a protein with 76% identity to Sso7d.

Applicants continue to submit that the use of conservative substitution and SAR data lowers the percent identity to below 60% because in addition to the natural variations between family members, any protein chemist readily understands that conserved substitutions are possible throughout the primary sequences of the prototype proteins. Applicants submit that the combination of all this knowledge permits those of skill to routinely identify species that have less than 60% identity, an example of which is provided by Dr. Vander Horn in section 14 of his declaration.

Applicants finally argue that the above referred to objective evidence that the claim limitation to 50% identity to Sso7d is a reasonable approximation of the ability of protein chemists to alter the primary sequence of the prototype while maintaining biological functions and that they have fully rebutted the prima facie case of non-enablement for claims 15-29 and 30-42.

Applicants arguments are acknowledged and have been considered in full but are found nonpersuasive. As previously stated, while methods to produce variants of a known sequence such as site-specific mutagenesis, random mutagenesis, etc. are well known to the skilled artisan producing variants as claimed by applicants (i.e., having sequence non-specific double-stranded nucleic acid binding activity) requires that one of ordinary skill in the art know or be provided with guidance for the selection of which of the infinite number of variants have the claimed property. Without such guidance one of ordinary skill would be reduced to the necessity of producing and testing all of the virtually infinite possibilities. This would clearly constitute undue experimentation. While enablement is not precluded by the necessity for routine screening, if a large

amount of screening is required, the specification must provide a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. Such guidance has not been provided in the instant specification. As previously stated the specification does not establish:: (A) regions of the protein structure which may be modified without effecting the sequence-non-specific-double-stranded nucleic–acid-binding activity and those which enhance the processivity of the polymerase domain; (B) the general tolerance of the domains to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any amino acid residue of said domains with an expectation of obtaining the desired biological function; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful. Because of this lack of guidance, the extended experimentation that would be required to determine which substitutions would be acceptable to retain function claimed and the fact that the relationship between the sequence of a peptide and its tertiary structure (i.e. its activity) are not well understood and are not predictable, it would require undue experimentation for one skilled in the art to arrive at the majority of those polypeptides of the claimed genus having the claimed activities.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any protein comprising two heterologous domains wherein the first domain is a sequence-non-specific-double-stranded nucleic–acid-binding domain joined to a second domain which is a DNA polymerase domain,

wherein said sequence-non-specific-double-stranded nucleic–acid-binding domain comprises an amino acid sequence that has at least 50% identity to a 50 amino acid subsequence of SEQ ID NO: 2 or said sequence-non-specific-double-stranded nucleic–acid-binding domain comprises an amino acid sequence that has at least 75% identity to the Sac7d sequence set forth in SEQ ID NO: 10. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard G. Hutson whose telephone number is (571) 272-0930. The examiner can normally be reached on 7:30 am to 4:00 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on (571) 272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard G Hutson, Ph.D.
Primary Examiner
Art Unit 1652

rgh
1/26/2005